DOCUMENT RESUME

ED 103 360 SP 008 965

AUTHOR Alpert, Judith L.; Hummel-Ross, Barbara
TITLE Teacher's Communication of Differential Performance Expectations for Boys and Girls.
PUB DATE 75
NOTE 18p.; Paper presented at the Annual Meeting of the American Educational Research Association (Washington, D.C., 1975)

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS Classroom Communication; Conditioned Response; *Elementary School Students; Expectation; *Feedback; Females; Males; Mathematics Instruction; Performance Factors; Reading Instruction; Response Mode; Sex Discrimination; *Student Teacher Relationship; *Teacher Attitudes; Teacher Behavior; *Teacher Response

ABSTRACT

To determine whether teachers treat boys and girls differently with respect to providing response opportunities and giving feedback reactions, five teacher's arithmetic sessions and six teacher's reading sessions were observed and tape recorded three times over a four-week period. Differences in (a) quality of response opportunity for boys and girls, and (b) teacher feedback reactions with boys and girls were compared by means of the correlated t test. The findings indicate that at least with respect to two teacher behaviors, response opportunities and feedback reactions, boys and girls are treated similarly in both arithmetic and reading instruction in grade three. (Author)

TEACHER'S COMMUNICATION OF DIFFERENTIAL PERFORMANCE EXPECTATIONS FOR BOYS AND GIRLS

Judith L. Alpert
Barbara Hummel-Ross
New York University

Teacher's Communication of Differential Performance Expectations for Boys and Girls

Boys and girls differ in achievement. Girls perform better in reading throughout the early elementary grades (Dwyer, 1973; Johnson, 1973) and boys perform better in arithmetic in high school (Maccoby, 1966). Several investigators have studied teacher behavior in an attempt to understand the relatively poor performance of elementary school boys in reading. The results generally indicate that teachers do not discriminate against boys (Davis & Slobodian, 1967; Good & Brophy, 1971; Evertson, Brophy & Good, 1972). However, there are some conflicting findings (Evertson, Brophy & Good, 1973). Moreover, there has been little research directed toward understanding the relatively poor performance of high school girls in arithmetic. The relatively poor performance may be related to teacher behavior with girls in elementary school and/or high school.

In light of the conflicting findings concerning reading instruction and the sparsity of studies concerning arithmetic instruction, the following study was conducted. The teacher behaviors considered in the present study concerned quality of response opportunity provided and feedback reactions. These teacher behaviors were considered

because laboratory and classroom studies as well as theory suggest such teach behavior may be important in facilitating learning (Travers, 1964; Flanders, 1970; Hughes, 1973; Alpert, 1974a).

METHOD

Subjects

The research was carried out in eight third-grade classes housed in four elementary schools in one large city. The schools serve an urban, racially mixed, lower-middle to lower-class population. Seven of the eight teachers were female. All eight teachers had a minimum of two years teaching experience. Teachers and principals were told that the purpose of the study was to learn more about the learning patterns of boys and girls in arithmetic and reading.

Instruments

Brophy and Good's (1969) procedure for coding and listing teacher feedback reactions was modified for the purposes of the present study. The following teacher feedback reactions were considered: eight terminal feedbacks (praise, affirmation of correct answer, no feedback reaction, negation of incorrect answer, criticism, process feedback, gives answer, asks other) and three sustaining feedbacks (repeats question, rephrases question or gives clue, gives new question). In addition to the

teacher feedback reactions, pupil sex (boy, girl), quality of pupil answer (right, wrong, no response) and five minute time periods were indicated. Reliability training procedures for the coding of teacher feedback reactions were essentially those outlined in Brophy and Good (1969) and involved coding from transcripts and videotapes, and coding in a classroom. Percent agreement was at least 85% between coders on three consecutive videotape recordings of arithmetic and reading group sessions.

Procedure

To determine how teachers treated boys and girls with respect to providing opportunities for different qualities of response and responding to pupil answers, five teacher's arithmetic sessions and six teacher's reading sessions were observed and tape recorded three times over a four week period. Thus, a total of 15 observations for arithmetic (3 observations x 5 teachers = 15) and 18 observations for reading (3 observations x 6 teachers = 18) were made. Prior to the first observation session, an attempt was made to habituate pupils and teacher to the presence of observer and tape recorder. The sessions, all more than twenty minutes long, were either with a small group or a whole class. No sessions with a high ability group were coded. During the observations coders

noted such information as number of boys, number of girls, type of group (small group instruction or whole class instruction), and anecdotes of teacher's expectation communications to boys and girls.

One major criticism of most of the investigations concerning teacher expectation and teacher behavior is that observers knew which pupils were members in each ability group, social class, and sex (Alpert, 1974b). In the present study, an attempt was made to minimize observer bias by having the coder simultaneously code and tape record the session during the observation visit. The tape recording of sessions enabled (a) each coder to check his coding following the session, and (b) coders to make consistency checks with each other. From the tape recordings, the percent agreement between coders (85%) was maintained on three consistency checks.

Data Analysis

Data for quality of responses by boys and girls were analyzed by instructional area (reading, arithmetic), yielding two major analyses. Data for the two analyses were treated similarly. That is, data for each teacher's session was corrected arithmetically for differences in number of boys and girls and number of five minute observations. The analysis was based on means for boys and girls across teachers and for five minute periods. Data

for the 11 teacher feedback reactions with boys and girls were analyzed by instructional area (reading, arithmetic) and by quality of pupil answer (right, wrong, no response), yielding six major analyses (2 levels of instruction x 3 levels of quality = 6). The data for the six analyses were treated similarly as indicated above.

Results

Descriptive data dealing with teacher behavior are considered first. Following, the data dealing with differential treatment of boys and girls are considered. Results presented in Table 1 indicate that the total number of responses for boys and girls in five minute arithmetic sessions was 5.71 and 5.81, respectively, or a total of 11.52 pupil responses to academic questions. Moreover, approximately 72% (8.25) of these questions were answered correctly. The relatively small number of wrong responses and no responses to teachers' academic questions is noted also. Results presented in Table 1 indicate that the total number of responses for boys and girls in five minute reading periods was 10.10 and 8.70, respectively, or a total of 18.70 pupil responses to academic questions. Moreover, approximately 78% (14.34) of these questions were answered correctly. The relatively small number of wrong responses and no responses to teachers' academic

questions in reading instruction is noted. Results in Table 2 together with results in Table 1 indicate that approximately 50% of right answers in arithmetic and reading were followed by affirmation of correct response. Less often teachers provided praise and no feedback. Results presented in Tables 3 and 4 together with the results in Table 2 indicate that wrong answers and failure to answer in arithmetic and reading were followed by a greater variety of teacher feedback reactions than were right answers. Results in Table 4 indicate that the largest mean number of teacher feedback reactions to pupil failure to answer was teacher asking another pupil the question. In summary, the data indicate that teachers in this study asked approximately 11.5 questions and 18.8 questions per five minute period in arithmetic and reading instruction, respectively, and that at least two-thirds of these questions were answered correctly. Moreover, the data indicate that correct responses were followed by affirmation and, less often, by praise or no feedback. Teacher feedback reaction was more variable when pupils failed to respond or responded incorrectly.

To consider whether the teachers treat boys and girls differently with respect to providing opportunities for different qualities of response (right, wrong, no response), see Table 1. The data for boys and girls indicate no sig-

nificant difference in quality of pupil answer during arithmetic or reading instruction. There was, however, a trend indicating more wrong responses for boys and more right responses for girls in arithmetic, and more right responses for boys in reading instruction. The correlated t test results in Tables 2-4 indicate no differential treatment in teacher's feedback reactions to boys and girls during arithmetic and reading instruction when quality of pupil response is controlled. In summary, the data indicate that teachers in this study treated boys and girls similarly in both arithmetic and reading instruction in providing opportunities for different qualities of response and in responding to pupil answer.

DISCUSSION

One implication of the present study concerns the descriptive data. There is some evidence which supports that positive and mild negative teacher reactions facilitate pupil achievement (Hurlock, 1925; Flanders, 1970; Hughs, 1973; Alpert, 1974b). In the present study, however, 50% of right answers were followed by minimal teacher reactions (affirmation), rather than positive teacher reactions (praise). However, before statements can be made about degree of nonfacilitative teacher behavior, more research is indicated concerning optimal numbers of and sequencing of teacher behaviors.

A second implication concerns teacher treatment of boys and girls. The data from numerous studies support that boys receive more attention, both positive and negative, during nonreading instructional time (for example, deGroat & Thompson, 1949; Lippitt & Gold, 1959; Spaulding, 1963; Brophy & Good, 1970). As indicated, previous research on teacher behavior during reading instructional time as well as results from the present study concerned with reading and arithmetic instructional time support that teachers do not discriminate against either sex during these sessions.

In light of the present findings, investigators should consider other educational factors beside quality of response opportunity and teacher feedback reactions, as well as societal and cultural factors, to better understand sex differences in achievement. A physiological maturational explanation of sex differences in achievement, however, does not seem warranted on the basis of recent studies. That is, Preston (1962) compared reading achievement of German and American children in fourth and sixth grades. Although Preston found the mean scores of American girls were superior to American boys, the reverse was true for German children. Also, Johnson's (1973) study of sex differences in elementary school

reading achievement in four English speaking nations indicates higher performance by boys in Nigeria and England and higher performance by girls in Canada and the United States. Although Husen's (1969) international study of achievement in arithmetic indicates that 13 year old boys perform better than girls, other data indicate the importance of societal-cultural-educational factors. For example, Husen indicates that there is differential treatment in opportunity afforded to the sexes for study of arithmetic.

Schools socialize boys and girls for academic sex-roles (Alpert, in press). Males and females are treated differentially with respect to some teacher behaviors, status in the educational system, curricular materials, texts, tests, extra-curricular activities, and assignment to classes. The present study indicates that, at least with respect to two teacher behaviors, response opportunities and feedback reactions, boys and girls are treated similarly in arithmetic and reading instruction in grade three.

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Table 1

Means, Standard Deviations of Differences, and Correlated t Values for Differences Between Boys' and Girls' Quality of Response During Arithmetic and Reading Instruction

Quality of Response by Academic Subject	Mean[a] Boys	Mean[a] Girls	S.D. of Difference	Correlated t[b]
Arithmetic				
Right	3.76	4.49	1.01	2.70
Wrong	1.19	.83	.26	1.36
No Response	.76	.49	.12	2.23
TOTAL RESPONSES	5.71	5.81		
Reading				
Right	7.72	5.73	.41	2.38
Wrong	1.96	1.59	.39	1.33
No Response	.33	.38	.05	.85
TOTAL RESPONSES	10.10	8.70		

[a] Means were corrected for differences in number of boys and girls and number of five minute observations; means indicate averages for five minute periods.

[b] Sampling unit was the teacher.

Table 2

Means, Standard Deviations of Differences, and Correlated t Values for Differences in Teachers' Feedback Reactions After Pupils' Right Answers During Arithmetic and Reading Instruction

Teacher Feedback Reaction by Academic Subject	Mean Number Reactions per 5 Minute Interval		S. D. of Difference	Correlated t
	Boys	Girls		
1. Praise				
Arithmetic	.81	.71	.74	.79
Reading	1.14	1.09	.22	.45
2. Affirmation of Correct Answer				
Arithmetic	2.00	2.58	.39	.68
Reading	5.26	4.06	.60	1.98
3. No Feedback Reaction				
Arithmetic	.58	.73	.14	1.04
Reading	1.07	1.16	.11	.89
4. Negation of Incorrect Answer				
Arithmetic	.00	.00	--	--
Reading	.00	.00	--	--
5. Criticism				
Arithmetic	.00	.00	--	--
	.00	.00	--	--
6. Process Feedback				
Arithmetic	.07	.04	.03	1.70
Reading	.05	.08	.01	1.35
7. Gives Answer				
Arithmetic	.00	.00	--	--
Reading	.00	.00	--	--
8. Asks Other				
Arithmetic	.04	.02	.02	.65
Reading	.00	.10	.08	1.25
9. Repeats Question				
Arithmetic	.00	.00	--	--
Reading	.02	.11	.02	.15
10. Rephrase or Clue				
Arithmetic	.10	.23	.13	.96
Reading	.18	.09	.09	.91

Table 2 (Cont'd.)

11. New Question				
Arithmetic	.10	.13	.11	.25
Reading	.06	.13	.03	2.00

Table 3

Means, Standard Deviations of Differences, and Correlated t Values for Differences in Teachers' Feedback Reactions After Pupils' Wrong Answers During Arithmetic and Reading Instruction

Teacher Feedback Reaction by Academic Subject	Mean Number Reactions per 5 Minute Interval		S. D. of Difference	Correlated t
	Boys	Girls		
1. Praise				
Arithmetic	.00	.00	--	--
Reading	.00	.00	--	--
2. Affirmation of Correct Answer				
Arithmetic	.00	.00	--	--
Reading	.00	.00	--	--
3. No Feedback Reaction				
Arithmetic	.05	.00	.03	1.73
Reading	.07	.03	.04	.92
4. Negation of Incorrect Answer				
Arithmetic	.08	.24	.15	1.05
Reading	.62	.48	.13	1.08
5. Criticism				
Arithmetic	.12	.04	.04	2.04
Reading	.01	.03	.01	2.00
6. Process Feedback				
Arithmetic	.02	.00	.01	1.40
Reading	.02	.01	.03	.33
7. Gives Answer				
Arithmetic	.04	.03	.05	.36
Reading	.38	.30	.24	.34
8. Asks Other				
Arithmetic	.34	.21	.14	.94
Reading	.24	.16	.10	.87
9. Repeats Question				
Arithmetic	.05	.07	.05	.47
Reading	.07	.20	.07	1.66
10. Rephrase or Clue				
Arithmetic	.23	.18	.05	.92
Reading	.47	.31	.24	.67
11. New Question				
Arithmetic	.22	.02	.10	2.03
Reading	.03	.06	.03	1.00

Table 4

Means, Standard Deviations of Differences, and Correlated t Values for Differences in Teachers' Feedback Reactions After Pupils' Failure to Answer During Arithmetic and Reading Instruction

Teacher Feedback Reaction by Academic Subject	Mean Number Reactions per 5 Minute Interval		S. D. of Difference	Correlated t
	Boys	Girls		
1. Praise				
Arithmetic	.00	.00	--	--
Reading	.00	.00	--	--
2. Affirmation of Correct Answer				
Arithmetic	.00	.00	--	--
Reading	.00	.00	--	--
3. No Feedback Reaction				
Arithmetic	.03	.00	.01	2.00
Reading	.00	.00	--	--
4. Negation of Incorrect Answer				
Arithmetic	.07	.01	.07	.90
Reading	.00	.00	--	--
5. Criticism				
Arithmetic	.03	.01	.05	.36
Reading	.01	.06	.06	1.00
6. Process Feedback				
Arithmetic	.00	.01	.01	1.40
Reading	.00	.00	--	--
7. Gives Answer				
Arithmetic	.02	.03	.04	.10
Reading	.10	.08	.03	.66
8. Asks Other				
Arithmetic	.24	.26	.07	1.06
Reading	.14	.07	.05	1.40
9. Repeats Question				
Arithmetic	.15	.06	.05	1.96
Reading	.02	.07	.04	1.20
10. Rephrase or Clue				
Arithmetic	.13	.09	.05	.69
Reading	.07	.07	.03	.67
11. New Question				
Arithmetic	.07	.09	.07	.24
Reading	.01	.02	.02	.33